


Memorandum

*Flex your power!
Be energy efficient!*

To: CHIEF DEPUTY DIRECTOR
DEPUTY DIRECTORS
DISTRICT DIRECTORS
DIVISION CHIEFS
PROGRAM MANAGER

Date: April 22, 2005
Revised August 5, 2005¹

From: 
RICHARD D. LAND
Chief Engineer


LAWRENCE H. ORCUTT
Acting Deputy Director
Maintenance and Operations

Subject: Overhead Sign Structure/Signal and Lighting Standards Policy

The Department adopted the 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaries & Traffic Signals" to ensure the safety and adaptability of overhead signs, signals and lighting standards. The 2004 Standard Plans for overhead sign structures (truss and tubular), signal and lighting standards are designed in conformance with the 2001 specifications for a 100 mph wind speed (3 second gust). Designs based on the 2001 specifications were necessary to improve the fatigue resistance of these structures. Overhead sign structures were also redesigned to allow for additional signage and traffic management devices to ensure that sign structures can be adapted to changing needs without replacement. The 2004 Standard Plans for overhead sign structures can now accommodate increased sign panel coverage, top mounted exit signs and other appendages without further strengthening. Future development of traffic signal standards for special wind areas is planned and will be based on national research that is just beginning.

The Department also adopted the mandated Cal/OSHA standards for overhead sign structures. Worker safety on overhead sign structures will be enhanced as a result of design changes made in accordance with these standards.

These changes have increased the amount of structural steel and the size of the foundations for new overhead sign structures. The increase in structural steel in signal and lighting standards is nominal, however the foundations have been redesigned in some cases. Accordingly, increased quantities of materials have increased costs by 30 to 70 percent for overhead sign structures and nominally for signal and light standards (see Attachment A).

To ensure uniform implementation of the new 2004 Standard Plans, the following policy applies to both Department projects and encroachment permits. The policy addresses new projects, projects in construction and the replacement, relocation and modification of existing overhead sign structures, signal and lighting standards. Specific design criteria are included in the attachments.

Policy:

- 1) Existing sign structures, and/or signal and lighting standards currently in place.
Requirement: No change if the structures and/or standards are in good condition.
- 2) All new projects containing sign structures, signals and/or lighting standards shall conform to the memorandum dated November 17, 2004, from the Chief Engineer (see Attachment B).
- 3) Overhead sign structures in current contracts under construction.
Requirement: All sign structures in the contract work shall be retrofitted with the worker safety elements as shown in Attachment C¹. The Resident Engineer shall issue a contract change order to retrofit the structure(s) with these elements. The Project Manager shall obtain and authorize any required additional funds required to accomplish this change.
- 4) Signal and lighting standards in current contracts under construction.
Requirement: If Standard Plan ES-7B, dated July 1, 1999, is included in the contract work, the Resident Engineer shall issue a contract change order to replace the July 1, 1999 standard with Revised Standard Plan ES-7B, dated December 30, 2004. This change is only required if the material has not been ordered or the foundation work has not begun. The Project Manager shall obtain and authorize any additional funds required to accomplish this change. All other signal and light standards may be constructed as specified in the contract.
- 5) Existing sign structures requiring relocation.
Requirement: The preferred option is to replace the existing structure with a new structure from the 2004 Standard Plans. As an alternative, the existing sign structure can be retrofitted to meet worker safety in accordance with the details in Attachment C¹, and checked to ensure that sign structure conforms to the 2001 AASHTO Specifications in Attachment D.

- 6) Existing sign structures, and/or signal and lighting standards, in good condition, requiring modification (additional sign panels or traffic management devices) without relocation.

Requirement: The preferred option is to replace the existing structure with a new structure from the 2004 Standard Plans. As an alternative, the existing sign structure can be retrofitted to meet worker safety requirements and checked to ensure that sign structure conforms to the 2001 AASHTO Specifications, Attachments C¹ and D, respectively.

Exceptions to this requirement for adding signs and light traffic management devices to sign structures, and/or signal and lighting standards are included in Attachment D.

- 7) Damaged signal and lighting standards requiring full or partial replacement.

Requirement: If the foundation is damaged, the existing lighting standard shall be replaced with a new standard conforming to the 2004 Standard Plans.

If the foundation is in good condition, the preferred alternative is to replace the signal and/or lighting standard with a new standard conforming to the 2004 Standard Plans. As an alternative, the components of lighting standard may be replaced with available components, in the current Department inventory, conforming to the original details in the Standard Plans.

Existing overhead sign structures, and signal and lighting standards not conforming to any of the conditions above need to be evaluated on a case-by-case basis. The Division of Engineering Services, Office of Design & Technical Services can provide technical support to verify Cal/OSHA and AASHTO Specification compliance. Please contact Tillat Satter, Senior Bridge Engineer, Office of Design & Technical Service at (916) 227-8676 or Calnet (916) 498-8676 for assistance and additional information.

Attachments

c: Robert A. Stott
Roberto Lacalle
Tillat Satter

¹ Attachment C was revised to improve the structural performance of the "Overhead Sign Safety Cable" under full Cal/OSHA loading and to improve vertical clearance under the overhead sign structure. If original Attachment C has already been fabricated or installed, the installation does not need to be replaced with the new details. The new details shall be used on all future retrofits.

Attachment A

Cost Information for 1999 Standard Plans replaced with 2004 Standard Plans

The examples below indicate what percentage increase and current estimated cost can be expected for furnishing and erection of various types of new sign structures. All percent increases below are based on current statewide pricing. Actual costs for specific contracts may be affected by total quantity, location and work schedule restrictions. No contingencies are included.

<u>Sign Structure (Truss - 1 Post)</u>	<u>60%-70% Cost Increase</u>
(Span-40 ft: Old design = \$49,000 New Design = \$82,000	67% cost increase)

<u>Sign Structure (Truss - 2 Post)</u>	<u>30%-40% Cost Increase</u>
(Span-118 ft: Old design = \$145,000 New Design = \$195,000	35% cost increase)

<u>Sign Structure (Tubular - 1 Post)</u>	<u>60%-70% Cost Increase</u>
(Span-38 ft: Old design = \$55,000 New Design = \$92,000	67% cost increase)

<u>Sign Structure (Tubular - 2 Post)</u>	<u>60%-70% Cost Increase</u>
(Span-123 ft: Old design = \$140,000 New Design = \$230,000	64% cost increase)

Memorandum

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To: DISTRICT DIRECTORS

Date: November 17, 2004


DESIGN, CONSTRUCTION, MAINTENANCE,
RIGHT OF WAY, TRAFFIC OPERATIONS, AND
LOCAL ASSISTANCE DIVISION CHIEFS

DESIGN, CONSTRUCTION, MAINTENANCE,
RIGHT OF WAY, TRAFFIC OPERATIONS, AND
LOCAL ASSISTANCE DEPUTY DISTRICT DIRECTORS

ROBERT A. STOTT
Deputy Division Chief
Structure Design Services & Earthquake Engineering
Division of Engineering Services

RICHARD D. LAND
Deputy Division Chief
Structure Design
Division of Engineering Services

From: J. MIKE LEONARDO
Acting Chief Engineer



Subject: Implementation and Distribution of the July 2004 Standard Plans

Use of the July 2004 Metric Standard Plans shall be in accordance with the attached Implementation Schedule. The 1999 Standard Specifications and the 1999 Standard Special Provisions (SSPs), with changes accommodating use of the new standard plans, will support the 2004 Standard Plans.

Hard copies of the 2004 Standard Plans book may be ordered through the Caltrans Publications Distribution Unit. A limited number of CDs containing the 2004 Standard Plans in a single PDF file are also available through the Caltrans Publications Distribution Unit. Caltrans personnel should place orders through their respective District or Headquarters Division Manuals Coordinator. The standard plans book is available only in a bound version.

The Publications Distribution Unit, Department of Transportation, is located at 1900 Royal Oaks Drive, Sacramento, California 95815, Telephone (916) 445-3520, and Fax (916) 324-8997, Publications Website: <http://caltrans-opac.ca.gov/publicat.htm>.

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Requests for the 2004 Standard Plans book from contractors, consultants, material suppliers, individuals or organizations not affiliated with the Department should be referred to the Caltrans Publications Distribution Unit.

Digital files of the complete book in PDF format and each plan sheet in DGN, DXF and PDF file format are available via the Caltrans Internet Website:

http://www.dot.ca.gov/hq/esc/oe/project_plans/HTM/04_plans_disclaim_met.htm

A "Digest of Changes" in the July 2004 edition of the Standard Plans is available via the above-referenced Caltrans Website. The "digest" lists only significant changes to the standard plans, so it will be necessary to view the plans carefully.

Future revisions or additions to the 2004 Metric Standard Plans will be made in electronic format through the use of the Caltrans Office Engineer e-mail List Server. To receive future updates, you must sign up at this website:

<http://www.dot.ca.gov/hq/esc/oe/oelist/>

This e-mail list server will provide e-mail notification of updates to Caltrans Construction Standards. This includes the Caltrans Standard Plans, Standard Specifications, and the Standard Special Provisions.

Please see that all personnel concerned with changes in Standard Plans receive a copy of this letter and the attachments.

Attachments

ATTACHMENT 1

IMPLEMENTATION SCHEDULE FOR USE OF 2004 STANDARD PLANS

1. Projects, including AADD, received in the Division of Engineering Services-Office Engineer (DES-OE) February 1, 2005, and later must be based on the use of the 2004 Standard Plans.
2. Projects received in DES-OE before February 1, 2005, that contain any of the items of work listed in Attachment 2 shall be immediately updated using one of the following methods:

Method 1. -Include construction detail project plan sheets derived from the applicable 2004 Standard Plan sheets related to the categories of work listed in Attachment 2 while retaining the 1999 Standard Plans as the supplement to the project plans. To facilitate this effort, the Division of Engineering Services will produce new and revised 1999 Standard Plan sheets covering Overhead Sign Structures, Type 1-B Signal Standard, Transition Railing and Traffic Control System. Or:

Method 2. -Revise the entire project so that it is based on the use of the 2004 Standard Plans.

Method 3. -Issue addenda to currently advertised projects in accordance with Department Policy (Decision Document #38) that requires cost benefit analysis and District Director approval if addenda are to be issued within 72 hours of bid opening. Use procedures outlined in Method 1 for updating.

http://projdel.dot.ca.gov/des/documents/decisiondocs/72_hours_timely_notice_to_bidders_of_bid_opening_postponement.pdf

Method 4. -Issue Contract Change Orders in accordance with Construction Policy for projects under construction and bid-opened projects. Use procedures outlined in Method 1 for updating.

3. All projects advertised after October 31, 2005, must be based on the use of the 2004 Standard Plans, regardless of OE submittal date. This includes shelf projects or any other projects that, although submitted prior to February 1, 2005, have encountered delays that have pushed project advertising beyond October 31, 2005.

ATTACHMENT 2

WORK WHICH SHALL BE UPDATED TO CONFORM TO APPLICABLE 2004 STANDARD PLANS

FURNISHING AND INSTALLING SUPPORTS FOR OVERHEAD SIGNS (TRUSS OR TUBULAR).

(Supports revised in accordance with AASHTO Specs 2001. Plans updated to make them compliant with OSHA worker safety requirements.)

RELATED 2004 STANDARD PLANS: 'S' SERIES (S1 THRU S37)

RELATED ITEM CODE NUMBERS AND DESCRIPTIONS:

152394	RELOCATE SIGN STRUCTURE
151581	RECONSTRUCT SIGN STRUCTURE
560208	FURNISH SIGN STRUCTURE (TUBULAR)
560209	INSTALL SIGN STRUCTURE (TUBULAR)
560218	FURNISH SIGN STRUCTURE (TRUSS)
560219	INSTALL SIGN STRUCTURE (TRUSS)

FURNISHING AND INSTALLING TYPE 1-B SIGNAL STANDARD

RELATED 2004 STANDARD PLAN: 'ES-7B'

RELATED ITEM CODE NUMBERS AND DESCRIPTIONS:

861301	RELOCATE TRAFFIC SIGNAL STANDARD
860xxx	SIGNAL AND LIGHTING
861501	MODIFY SIGNAL AND LIGHTING

CURB RAMP CONSTRUCTION.

(The curb and curb ramp plans have been revised so that they are compliant with current ADA requirements.)

RELATED 2004 STANDARD PLANS: A87A, A87B, A88A, A88B, A90A and A90B.

RELATED ITEM CODE NUMBERS AND DESCRIPTIONS:

731502	MINOR CONCRETE (MISCELLANEOUS CONSTRUCTION)
731623	MINOR CONCRETE (CURB RAMP)
731626	MINOR CONCRETE (CURB AND CURB RAMP)
731627	MINOR CONCRETE (CURB, SIDEWALK AND CURB RAMP)
731655	CURB RAMP
731656	CURB RAMP DETECTABLE WARNING SURFACE

ATTACHMENT 2 (Cont.)

METAL BEAM GUARD RAILING OR THRIE BEAM BARRIER RAILING THAT TRANSITION TO BRIDGE RAILING, ABUTMENTS OR WALLS.

(New transition railing details that meet NCHRP 350 Test Level 4 requirements are included in the railing and barrier plans.)

RELATED 2004 STANDARD PLANS: 'A77 SERIES'- [A77J4, 'Transition Railing (Type WB)'] 'A78 SERIES'- [A78J, 'Transition Railing (Type STB)'] and [A78K, 'Transition Railing (Type DTB)']

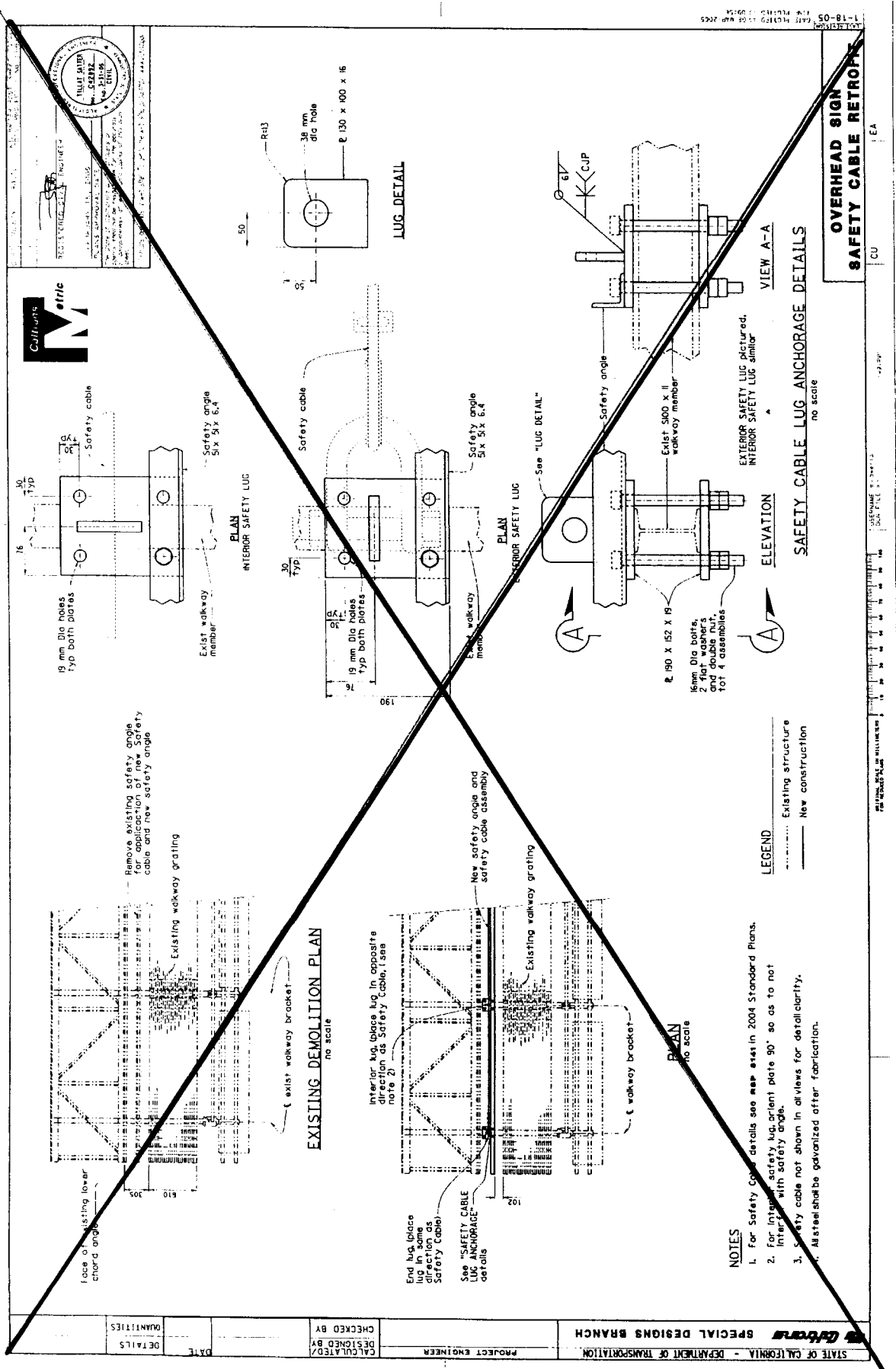
RELATED ITEM CODE NUMBERS AND DESCRIPTIONS:

151572	RECONSTRUCT METAL BEAM GUARD RAILING
152397	RELOCATE METAL BEAM GUARD RAILING
832001	METAL BEAM GUARD RAILING
832002	METAL BEAM GUARD RAILING (STEEL POST)
832003	METAL BEAM GUARD RAILING (WOOD POST)
151568	RECONSTRUCT THRIE BEAM BARRIER
151570	RECONSTRUCT DOUBLE THRIE BEAM BARRIER
839301	SINGLE THRIE BEAM BARRIER
839303	SINGLE THRIE BEAM BARRIER (STEEL POST)
839302	SINGLE THRIE BEAM BARRIER (WOOD POST)
839310	DOUBLE THRIE BEAM BARRIER
839311	DOUBLE THRIE BEAM BARRIER (WOOD POST)
839312	DOUBLE THRIE BEAM BARRIER (STEEL POST)

TRAFFIC CONTROL SYSTEM.

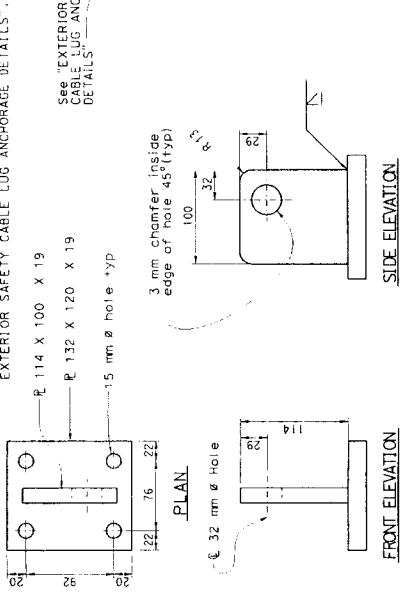
(These plans have been revised so that they are compliant with MUTCD requirements.)

RELATED 2004 STANDARD PLANS: T10, T10A, T11, T12, T13. T14, T15, T16 and T17.

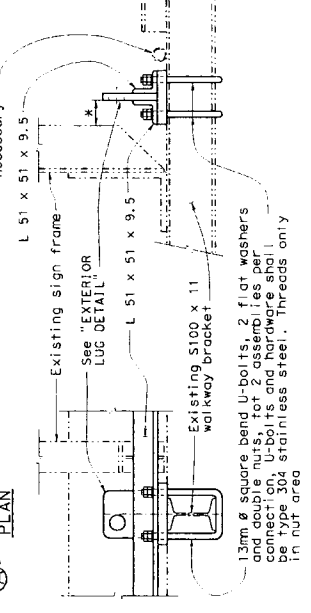
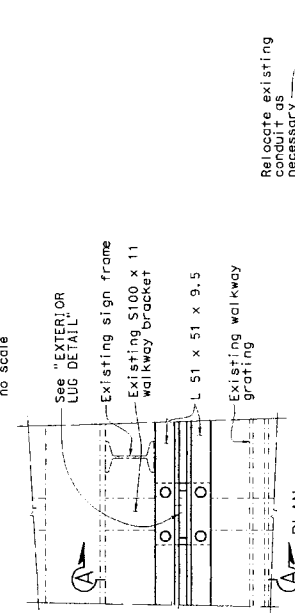


Attachment C- Replaced by
Attachment C "Overhead Sign Safety Cable
Retrofit 1 and 2" dated 6/27/05

NOTE:
No bolt holes required for "ALTERNATIVE EXTERIOR SAFETY CABLE LUG ANCHORAGE DETAILS".



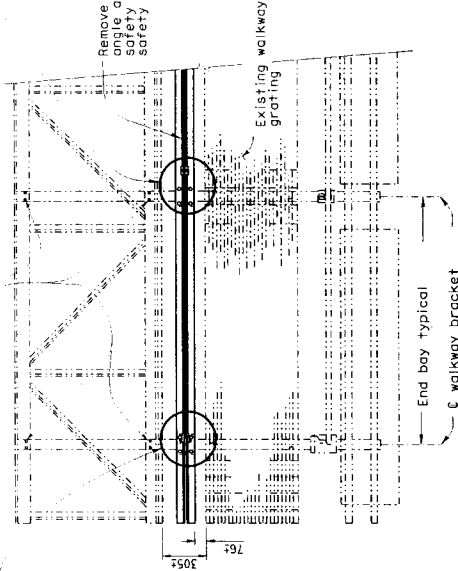
EXTERIOR LUG DETAILS



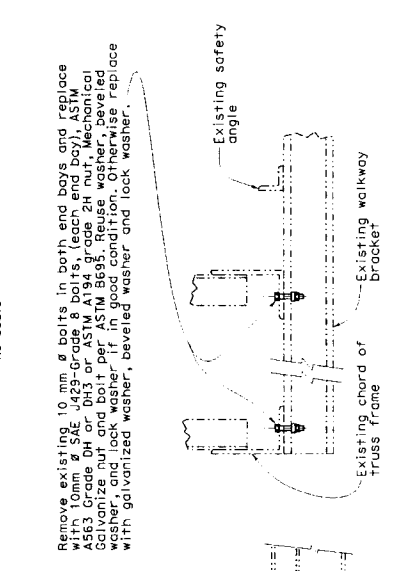
EXTERIOR SAFETY CABLE LUG ANCHORAGE DETAILS

* minimum of 51mm clear from sign face or sign frame.
THE CONTRACTOR SHALL VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING ANY MATERIAL.

See "EXTERIOR SAFETY CABLE GUIDE AND ANGLE ANCHORAGE DETAILS".



BOLT REPLACEMENT AND SAFETY ANGLE DETAIL



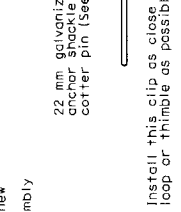
BOLT REPLACEMENT AND SAFETY ANGLE DETAIL

no scale
LEGEND
Existing structure
New construction

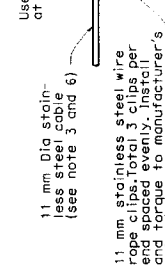


REGISTERED CIVIL ENGINEER
JUNE 27, 2004
EXPIRATION DATE
NO. 048802
E.C.E.

22 mm galvanized bolt anchor shackle with cotter pin (See Note 4)



END SAFETY CABLE



END SAFETY CABLE

no scale

NOTES

1. Safety cable not shown in all views for clarity.
2. Unless otherwise shown all steel shall be galvanized after fabrication.
3. Stainless steel cable shall be 6 x 19 IWRC construction using type 304 stainless steel. Cable shall be 70 KN, minimum safe working load 11kN. Cable shall be free of kinks, knots, or deformation and shall be continuous with no splices. Safety cable shall not be prestretched.
4. Shackle shall be galvanized steel with working load limit of 57 KN.
5. Place an equal amount of washers on each side to align cable with end lug without restricting shackle ball rotation or contacting cable.
6. Prior to tightening cable clips at exterior anchorage, slack in cable shall be removed by the full effort of a typical construction worker.

OVERHEAD SIGN SAFETY CABLE RETROFIT 1

CU

100/200

Attachment C 1 of 2

Attachment D

AASHTO Specification and Department Requirements:

- 1) All overhead sign structures, signals and lighting standards shall conform to the 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires & Traffic Signals" as amended by the 2002 Interim.
- 2) A minimum basic wind speed of 85 mph is required for all structures. A minimum basic wind speed of 100 mph is required for special wind regions as defined in figure 3-2 of the AASHTO Specifications. Known local conditions should be considered.
- 3) A minimum design life of 50 years is required for all new designs.
- 4) Fatigue category III is required as a minimum for all overhead sign structures.
- 5) Previous modifications to an existing structure must be included in the analysis.
- 6) Field welding on existing structures is not permitted.

Exceptions To AASHTO Specification Requirements:

Nominal increases in loading need not be evaluated for conformance to the AASHTO criterion. Welding or drilling holes in existing structures will not be permitted under the exception process. Nominal increases in loading are defined as follows:

Signal standards:

See table for post loading criteria. Loading on the signal arm is limited to 10 lbs and 1 square foot of wind area. Previous modifications to an existing structure must be included.

Lighting standards:

See table for post loading criteria. No elements may be added to the luminaire arm in any case. Previous modifications to an existing structure must be included.

Attachment D

Overhead Sign Structures:

A maximum addition of 50 lbs and 8 square feet of wind area. Previous modifications to an existing structure must be included.

Cal/OSHA Requirements for Overhead Sign Structures

- 1) A 42-inch high handrail is required on all new overhead sign structure walkways.
- 2) A fall restraint system with rigging for horizontal movement is required for all new and existing overhead sign structure walkways. Anchorage and rigging shall be designed for a minimum load of 5000 pounds (ultimate).

**Maximum Allowable Loading and Signage for
Existing Lighting Standards and Traffic Signal Posts**

Standard Plan	Lighting Standards	Basic Wind Speed (85 mph)		Special Wind Area (100 mph)	
		Area sq.ft	Weight lbs.	Area sq.ft	Weight lbs.
1999 & 2004	All Lighting Standards	10	40	5	40
	All Traffic Signals: Except 17-3-129/161, 29A-5-129/161, 29-5-129/161	20	40	15	40
	17-3-129/161	20	40	0	0
	29A-5-129/161, 29-5-129/161	20	40	5	40
	All Lighting Standards	5	40	2	40
1977 to 1997	All Traffic Signals	10	40	5	40

Notes:

1. Additional loads and signs can only be mounted on the structure post.
2. Signs and fixtures can not be mounted higher than 12 feet from the base plate.
3. No additional loads or signs may be added to structures built before 1977 Standard Plans.
4. Previous modifications to an existing structure must be included.
5. No field welding or drilling on structure is allowed.